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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,645

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Masami Miura

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1480

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WENDEROTH, LIND & PONACK, L.L.P.

1030 15th Street, N.W.,

Suite 400 East

Washington, DC 20005-1503

EXAMINER

JANAKIRAMAN, NITHYA

ART UNIT

PAPER NUMBER

2123

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/529,645	Applicant(s) MIURA ET AL.	
	Examiner NITHYA JANAKIRAMAN	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 2-4, 6-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/23/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to the submission filed on 1/5/09. Claims 1-10 are presented for examination.

Response to Arguments- Specification

1. Applicant's amendments with respect to the title, abstract, and written descriptions have been entered. The objections to the title and abstract have been withdrawn.

Response to Arguments – 35 U.S.C §101

2. Applicant's arguments filed 1/5/09 have been fully considered and are persuasive. Rejections have been withdrawn.

Response to Arguments 35 U.S.C §103

3. Applicant's arguments filed 1/5/09 have been fully considered but they are not persuasive.

4. Applicant argues on pages 10-11 that Krishnamurthy and Bronskill do not teach each and every limitation of the independent claims. Appellant's arguments appear to summarize the claim language, summarize the prior art references, and allege that the prior art references do not teach the claim language. The allegations remain unsupported by any argument other than the generic allegation that the prior art fails to teach the recited claim language. These allegations are refuted below.

Specification

5. The substitute specification filed 1/5/09 has been received and has been entered.

Claim Objections

6. Claims 2-4 and 6-8 are objected to because of the following informalities: the depending claims begin with the word "Said". While technically not improper, dependent claims typically begin with "The".

Allowable Subject Matter

7. Claims 2-4 and 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

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commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 5, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,256,038 ("Krishnamurthy") in view of US 6,201,549 ("Bronskill"), in view of JP 62135965 ("Kuragano").

10. Krishnamurthy teaches a computer aided design system for designing curved surfaces. However, Krishnamurthy does not teach defining tangent and normal vectors to the curved mesh surface.

11. Bronskill does teach these limitations (*see Figure 8*).

12. Krishnamurthy and Bronskill are analogous art because they are both related to the field of CAD design.

13. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the tangent and normal vectors of Bronskill with the CAD system for curved surfaces of Krishnamurthy, motivated by the desire to produce "highly realistic...images" (*Bronskill: column 9, lines 60-67*).

14. Krishnamurthy and Bronskill teach a computer aided design system, but do not teach a first tangent vector and second tangent vector for creating a tangent plane of a mesh at a certain mesh point.

15. Kuragano does teach this (*see Constitution*).

16. Krishnamurthy, Bronskill and Kuragano are all analogous at as they are related to the field of CAD design.

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17. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the tangent vectors of Kuragano with the CAD system of Krishnamurthy and Bronskill, motivated by the desire to “execute the calculating processing of a complicated curved surface with a simple interpolating calculation by connecting easily the mutual section between adjoining patches under the condition of a tangent plane continuity” (*Kuragano, Purpose*).

18. Regarding claims 1, 5, 9 and 10, Krishnamurthy and Bronskill teach:

A computer aided design system (*Krishnamurthy: column 2, lines 28-44*) comprising:
a point sequence information extraction device which extracts a plurality of point sequences on a curved surface (*Krishnamurthy: column 6, lines 39-59 “approximation mesh points”; column 8, lines 6-34, “face-point curve*);

a dividing device which generates a curved surface from said point sequences using another computer aided design system, and divides said curved surface into a mesh having a predetermined number of mesh points (*Krishnamurthy: column 8, lines 6-34, “polygon mesh”, “face-point curve”*);

a first fundamental form computing device for computing coefficients of a first fundamental form at a mesh point of said mesh, said coefficients of the first fundamental form being defined at said mesh point by a first tangent vector and a second tangent vector which define a tangent plane of said mesh at said mesh point (*Kuragano: first and second tangent vectors are set so that the conditions of the tangent plane continuity can be established*);

a second fundamental form computing device for computing coefficients of a second fundamental form at said mesh point, said coefficients of the second fundamental form being defined at said mesh point by a tangent vector in said tangent plane at said mesh point (*Kuragano: first and second tangent vectors are set so that the conditions of the tangent plane continuity can be established*) and a normal vector of said mesh at said mesh point (*Bronskill: Figure 8, column 6, lines 10-24, “tangent vector”, “normal vector”*); and

a memory device which stores said point sequence information, said coefficients of the first fundamental form and said coefficients of the second fundamental form (*Krishnamurthy: column 2, lines 28-44, “computer implemented method”*).

Allowable Subject Matter

19. Krishnamurthy, Bronskill, and Kuragano all teach a computer aided design system which computes a principal curvature of mesh. However, these references and the remaining prior art of record in combination with the remaining elements and features of the claimed invention, fails to disclose or suggest “features of said curved surface, said five feature quantities comprising a Gaussian curvature and a mean curvature computed based on said principal curvature, said principal direction, said line of curvature, and said coefficients of the first fundamental form and said coefficients of the second fundamental form” (claims 2, 6).

Additional Art Cited

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

21. US 6,236,403:A method of modeling a 3-dimensional object including performing one of a rounding operation generating the 3-dimensional object from a control grid and an inverse rounding operation generating a control grid from the 3-dimensional object depending on which one of the control grid and the 3-dimensional object is newly provided, the control grid including a plurality of edges and a plurality of vertexes, the 3-dimensional object including a plurality of boundary curves and a plurality of curved surfaces deforming the control grid by shifting the plurality of vertexes

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- The Examiner would like to point out that while only certain citations have been given, Applicant should consider the reference in its entirety.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NITHYA JANAKIRAMAN whose telephone number is (571)270-1003. The examiner can normally be reached on Monday-Thursday, 8:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571)272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nithya Janakiraman/
Examiner, Art Unit 2123

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit
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